

A Full-Function Motherboard To Explore Geode™ Capabilities



General Description

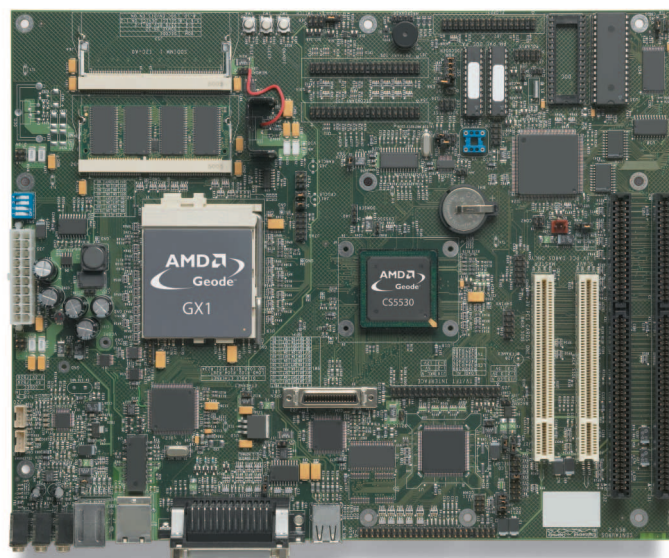
The AMD Geode™ SP4GX10 system platform is the development platform for the AMD Geode™ GX1 processor and the AMD Geode™ CS5530A I/O companion device. It is a full-function motherboard needing only the standard suite of peripherals (floppy, hard disk, CD-ROM drive, power supply, monitor, mouse and keyboard, which are not included with the platform). This is the ideal platform to explore the advantages and capabilities of the GX1 processor and CS5535 companion device and for software development targeting those devices. The platform contains additional devices such as an Ethernet controller, a Super I/O and an audio codec to complete the platform. This platform is shipped with the AMD XpressROM BIOS, an 8 MB M-Systems DiskOnChip (DOC) and 64 MB of PC-133 system memory.

AMD Geode™ SP4GX10 System Platform

Product developers can make use of this platform to immediately begin developing software and hardware add-ons for an information appliance product without having to design an AMD Geode-based system platform first.

The SP4GX10 system platform is based on the GX1 processor and CS5530A I/O companion device. BIOS support for the SP4GX10 system platform is provided by XpressROM firmware, while the Super I/O chip delivers a variety of PC-standard interfaces for keyboard, mouse and other common devices. Audio interfaces are supported through the codec. Populated sockets are provided for DOC and Flash ROM devices. The board includes two ISA slots and two 3.3V PCI slots. A wide range of jumper and software-selectable options exist, allowing configuration of the platform to address specific development requirements. The processor's clock frequency and core voltage may be easily changed.

The SP4GX10 system platform is intended for a laboratory setting and as such does not include a chassis. The open design gives the developer easy access to hardware for test, measurement and the connection of oscilloscopes and logic analyzers. The board provides a simple method for making independent power measurements of key components.



Technical Specifications

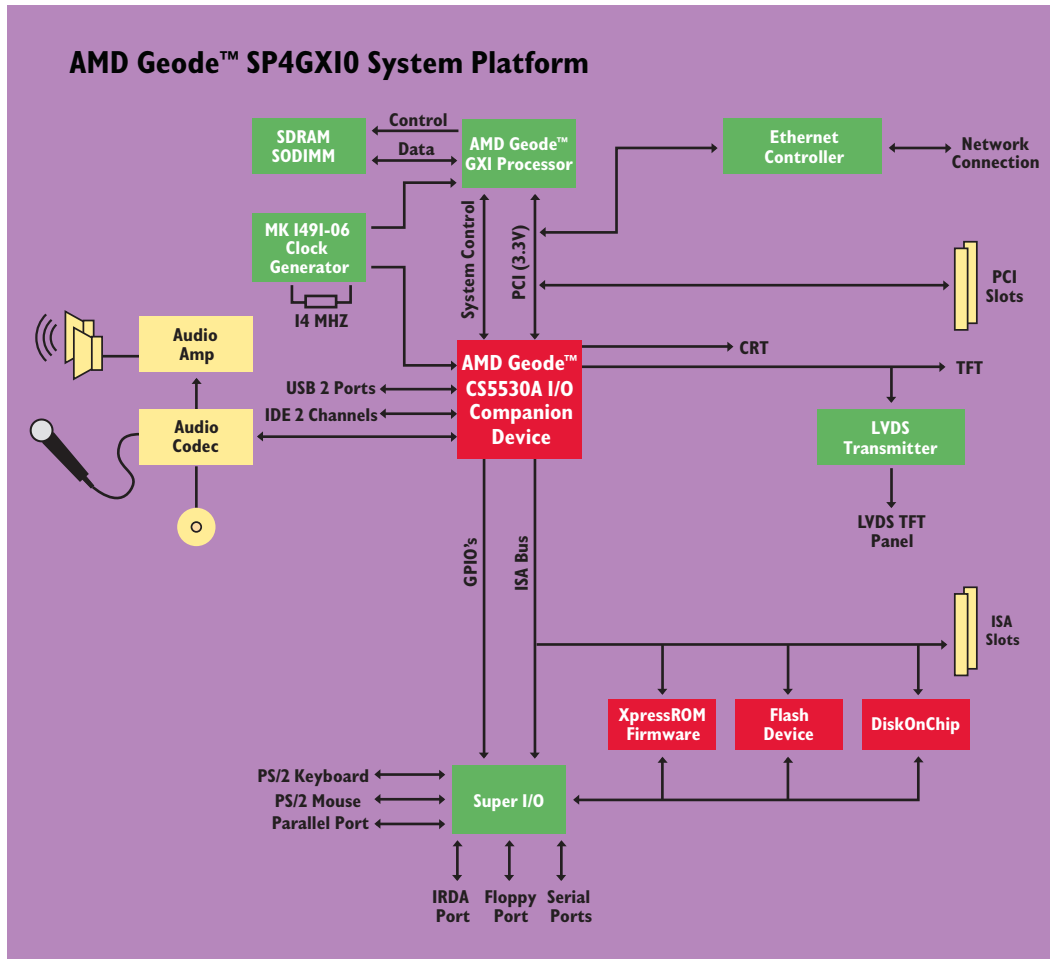
Shipped Configuration

- 64 MB of PC-133 SDRAM
- GX1-333 MHz processor
- 8 MB DiskOnChip (empty)
- IDE and floppy drive cables
- Bag of jumpers and mounting feet
- CD-ROM containing all board and component documentation, plus example and test software
- XpressROM firmware

Processor, Chipset and Supporting Chips

- GX1 processor; SPGA (Staggered Pin Grid Array) package only
- CS5530A I/O companion device
- Audio codec
- Super I/O controller
- Ethernet controller
- Dual-pixel LVDS (Low Voltage Differential Signaling) display interface
- Microclock MK1491-06 system clock generator

AMD Geode™ SP4GXIO System Platform



Memory and Flash Configurations

- Supports up to 256 MB system memory
- Two 144-pin unbuffered 8-byte wide SODIMMs sockets
- 2-Mbit or 4-Mbit sector-erase Flash PROM
- Selectable 16-Mbit TSOP Flash for boot ROM and bootable Flash disk implementation
- DiskOnChip support
 - M-Systems Flash Disk module
 - 2 MB to 288 MB supported
 - DOC interface for 3.3V or 5V
- Real-time clock with 242 bytes of bank-selectable CMOS memory
- SDRAM auto-detect and size with support for optimization via SPD (Serial Presence Detection) serial EEPROM
- Serial EEPROM for alternative storage of non-volatile data (in place of CMOS)
- Separate frame buffer SDRAM for DSTN support

Software Support

- Current OS (operating system) support
 - DOS 6.22
 - Linux
 - Microsoft® Windows®, CE, CE .Net, XPe
- Firmware options
 - Shipped with XpressROM firmware

XpressROM Firmware

- Provides standard BIOS functionality
- VSM (Virtual Support Module) for legacy functions
 - Power management
 - 16-bit audio
 - Standard VGA compatibility
- Stored in FlashROM
- Preboot execution environment integration code

Expansion Capabilities

- Standard ATX I/O shield
- Two 3.3V (only) PCI slots
 - Adapter board Babel allows 5.0V cards to 3.3V slots
 - One bus-master PCI slot
 - One slave PCI slot — through stuff options, this slot can become a master (requires disabling the Ethernet controller)
- Two ISA slots: one slave, one master

Mechanical

- ATX full-size form-factor 9.6" x 12.0"
- Ethernet and IDE activity indicators
- Soft on/off, sleep, reset controls; on-board or external

Power Measurement, Management and Control Options

- Adjustable I/O regulator ranges from 1.2V to 3.6V
- Adjustable core power regulator ranges from 1.30V to 3.85V
- Isolated power planes for independent current measurements of
 - Processor core and I/O
 - Board-level 3.3V, 5.0V and 12.0V
 - SDRAM (SODIMM)
 - USB external devices
 - CS5530A companion device
- Power management PAL (Programmable Array Logic) enable option stops PCI clock (except PCI clock to processor)
- CPU temperature monitoring allows for thermal shut down protocols (software development required)
- Multiple pad options for ferrite beads and caps on CS5530A companion device VCC for various decoupling and noise reduction
- SUSP_3V optional connection to ENABLE pin on the CPU core voltage regulator, for aggressive power management test and implementation
- WakeOnRing hardware support through serial port I or RINGIN# external device
- Wake-On-LAN support
- External Suspend/Resume SMI via on-board or external momentary switch

Standard Interfaces

- Automatic hardware over-current protection for hot plugging of mouse, keyboard, etc.
- One I6550 compatible UART (Universal Asynchronous Receiver/Transmitter) with I6-byte FIFO
- Parallel port with hardware support for standard, bidirectional and enhanced port protocol (EPP)
- Two-drive floppy controller with I6-byte FIFO and 2.88 MB support (XpressROM firmware supports one FDD and 1.44 MB drives, only)
- PS/2 keyboard and mouse ports
- IrDa-compliant infrared interface
- Ultra DMA/33 IDE support
- Two-port OCHI (Open Host Controller Interface) USB implementation
- Ethernet port
- AC97 V2.1-compliant audio
- VGA DDC2 support to 1280x1024x8 bpp
- Standard open LDI connector for LVDS flat panels

Test Points and Special Access Features

- ROM, DOC or FlashROM jumper and resistor stuff options for booting
- RWCLK, PCI SYCLK and PCI FRAME# probe points
- SUSP#, SUSPA#, SMI#, INTR and SUSP_3V header access
- SDRAM clock, data, address and control probe points
- SDCLK_OUT to SDCLK_IN selectable delay included in board design
- JTAG headers for GXI processor
- IRQI access support for test of external keyboard controller
- Resistor stuffing options
 - Super I/O removal from the ISA bus
 - External PCI clock insertion
 - SODIMM_OUT clock strength may be doubled
 - USB connection to open LDI header

System Clocking

- Microclock MKI49I-06 system clock generator timing signals
 - Adjustable clocks to the GXI processor, PCI slots, CS5530A companion device and Ethernet controller
 - 4.318 MHz ISA bus clock
 - 14.318 MHz CS5530A companion device clock
 - 24.576 MHz AC97 audio clock
 - 14.318 MHz clock to Super I/O
 - 48 MHz clock to AMD Geode CS5530A companion device for USB

Display Options and Support

- Flat-panel header for connecting either a TFT flat panel or TFT debug daughter board
- Strapping option allows selection of eight LCD types
- LVDS interface
- Adapter board (Rigel) provides LCD interface with contrast control
- Strap resistors support all possible LVDS transfer modes including single channel to single channel conversion and single channel to dual channel conversion
- VGA with DDC2 supported to 1280 x 1024 x 8 bpp

Environmental Goals

- Temperature
 - Operating: 0°C to 40°C
 - Non-operating: -20°C to 60°C
- Relative humidity
 - Operating: 20% to 80%, non-condensing
 - Non-operating: 5% to 95%, non-condensing
- Altitude
 - Operating: sea level to 10,000 feet (3,048 meters)
 - Non-operating: sea level to 40,000 feet (12,160 meters)

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About AMD

Founded in 1969 and based in Sunnyvale, California, AMD (NYSE: AMD) is a global supplier of integrated circuits for the personal and networked computer and communications markets with manufacturing facilities in the United States, Europe, Japan

and Asia. AMD, a Standard & Poor's 500 company, produces microprocessors, Flash memory devices and silicon-based solutions for communications and networking applications.

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